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Chilehexops, a New Funnelweb Mygalomorph Spider Genus from Chile (Araneae, Dipluridae)

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ABSTRACT

A new genus, *Chilehexops,* is established for the diplurid spiders *Accola australis* Mello-Leitão and a new species, *C. platnicki,* both from Chile. *Chilehexops,* which appears to be allied to the Euagrinae, is characterized by an elongate male palpal tibia, heavily sclerotized spermathecal trunks, the absence of posterior median eyes, and the absence of mating spurs, apophyses, or keels on the legs of males. Diagnoses, descriptions, illustrations, and locality records are provided for both species.

INTRODUCTION

While preparing his major treatise on mygalomorph spider classification, Raven (1985) discovered that *Accola australis* Mello-Leitão (1939), a small, six-eyed diplurid spider from Chile, belongs to a new genus which is allied to the Euagrinae and not to the Masteriinae, where it had been placed. Thanks chiefly to the recent collecting and curatorial efforts of Dr. Norman I. Platnick and Mr. Pablo A. Goloboff, enough specimens of this genus have accumulated to make the present taxonomic study possible.

Little is known about the natural history of this new genus, *Chilehexops.* These spiders usually live in small webs under rocks. All known populations occur in the warm temperate zone south of the Atacama Desert in northern Chile (from 27 to 34°S latitude) and range in elevation from 30 to 1950 m. The northernmost populations (see map 1) experience a more arid climate than the Mediterranean climate of the Santiago region, where the southernmost populations are found. The two known species are sympatric,

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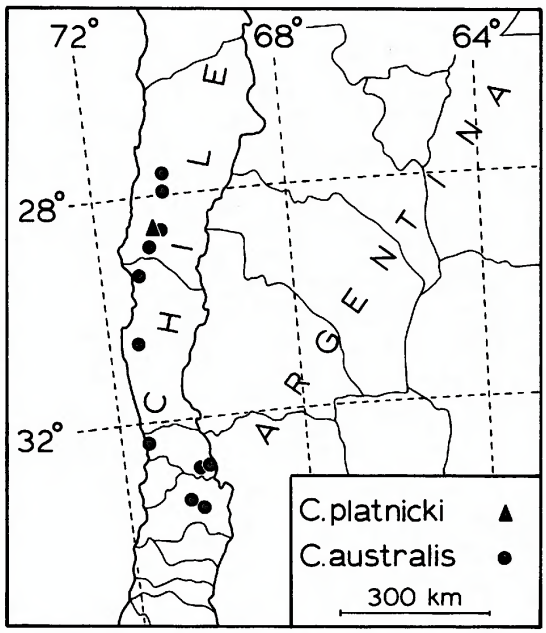


Map 1. Southern part of northern Chile, showing distribution of *Chilehexops* species.

and at one locality (3 km south of Vallenar, Atacama Province) both species were collected from the same arid "scrubby mountainside" habitat at 460 m elevation.

RELATIONSHIPS

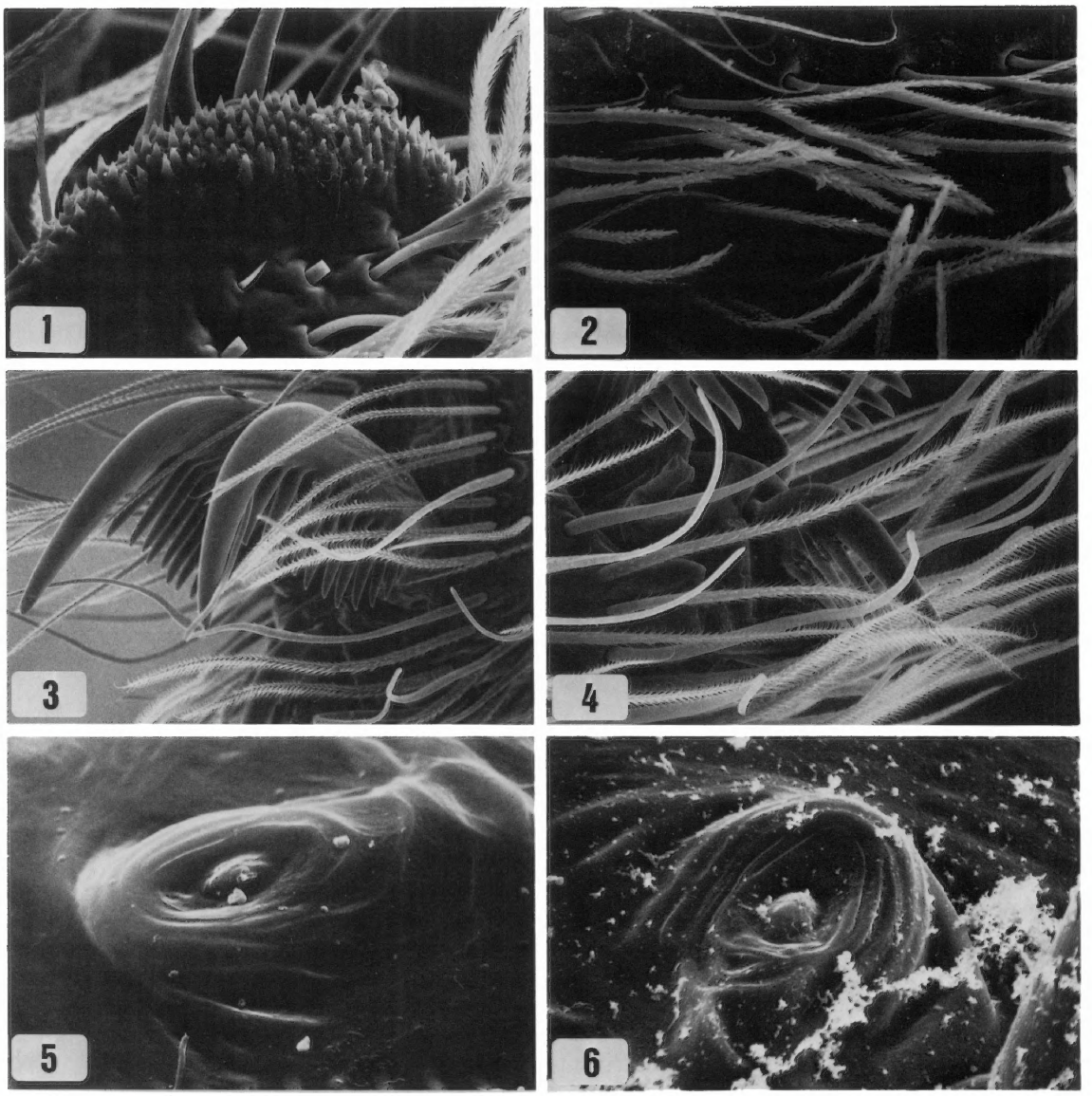
Chilehexops is defined by two probable autapomorphies: an elongate male palpal tibia (figs. 22, 25) and heavily sclerotized spermathecal trunks (figs. 28–34). Because *Chilehexops* lacks maxillary cuspules and shares none of the several masteriine apomorphies, Raven (1985) placed these spiders in his Euagrinae in spite of the absence of known synapomorphies uniting *Chilehexops* with the other euagrines. No such synapomorphies have yet been revealed.

The sister group of *Chilehexops* appears to be an undescribed taxon recently discovered in northeastern Argentina by Goloboff (personal commun.). Defined by two apparent autapomorphies, serrula teeth arranged in linear clusters and the absence of a fovea, this putative genus (my opinion, not Goloboff's) is united with *Chilehexops* by one synapomorphy: the absence of posterior median eyes. That the two median eyes of *Chilehexops* are anterior medians and not posterior medians is revealed by their darker color (no tapetum), their strongly protruding lenses, and their nearly circular shape.

The sister group of this pair of genera is not yet apparent. At one point in this study, the presence of bifid hairs on the prolateral face of the maxilla (figs. 1, 2), a condition discovered by Goloboff (personal commun.) and previously unreported for diplurids, appeared to be a synapomorphy uniting these two genera with *Microhexura.* However, careful examination (at 100× and 400× under a compound microscope) of cleared maxillary exoskeletons from 10 other diplurid genera has greatly weakened this hypothesis; small numbers of bifid maxillary hairs, obscured by normal hairs, were found in eight genera (*Euagrus, Phyxioschaema, Allothele, Cethegus, Stenygrocercus, Masteria, Ischnothele,* and *Thelechoris*). Further study of the form and distribution of these bifid hairs is desirable, however, since in these eight genera they constitute a smaller percentage of the prolateral maxillary hair population and the two branches are less symmetrical than in *Chilehexops,* its sister genus, and *Microhexura.* In the only other genera examined, *Diplura* and *Linothele,* no bifid maxillary hairs were found.

ACKNOWLEDGMENTS

Mr. Pablo A. Goloboff of the Museo Argentino de Ciencias Naturales (MACN), Dr. Norman I. Platnick of the American Museum of Natural History (AMNH), and Ms. C. Stocker of the Naturhistorisches Museum, Basel (NMB) kindly loaned the *Chilehexops* specimens in their museums. Dr. Herbert W. Levi of the Museum of Comparative Zoology generously provided work space and literature. Ms. Jacqueline M. Palmer and Mr. Ed Seeling of the Museum of Comparative Zoology provided essential technical assistance with the scanning electron microscopy. I thank Dr. Platnick, Dr. Robert J. Raven, and Mr. Goloboff for reviewing drafts of this paper. This study was supported by National Science Foundation Grant DEB-8104682 and by the Exline Frizzell Fund for Arachnological Research, California Academy of Sciences.



Figs. 1–6. **1.** Serrula of female *Chilehexops platnicki,* new species, showing associated bifid hairs, 400×. **2.** Bifid hairs near serrula of female *Microhexura montivaga* Crosby and Bishop, 640×. 3, 4. Tarsus I claws of female *C. platnicki,* new species. **3.** Superior claws, 230×. **4.** Unpaired claw, 445×. 5, 6. Tarsal organ on female tarsus I. **5.** *C. platnicki,* new species, 2795×. **6.** *C. australis* (Mello-Leitão), 3685×.

METHODS

The quantitative characters used in this study are abbreviated and defined as follows: CTP, number of cheliceral teeth in the prolateral row; CTR, number of retrolateral cheliceral teeth (located near the proximal end of the prolateral row); ITS and IMS, number of ventral and prolateral spines (macrosetae) on male tibia I and metatarsus I, respectively; PTS, number of spines on the distal end of the male palpal tarsus (cymbium); CL, carapace length; CW, carapace width; OQW, ocular quadrangle width; ALS, minimum distance between anterior lateral eyes; AMS, minimum distance between anterior median eye pupils; AMD, transverse diameter of left

anterior median eye pupil; ALD, maximum diameter of left anterior lateral eye; PFL, palpal femur length; PPL, palpal patella length; PTL, palpal tibia length; PTD, maximum diameter of palpal tibia in retrolateral view; PTarL, palpal tarsus length; IFL, ITL, IML, and ITarL, lengths of leg I articles; MSL, length of posterior median spinneret; LSL1, LSL2, and LSL3, lengths of posterior lateral spinneret articles (LSL1 = basal article) measured in ventral view.

All carapace and eye measurements were performed with the lateral borders of the carapace on the horizontal plane. The length of each pedipalp and leg I article was measured in retrolateral view and equals the distance from the proximal point of articulation to the most distal point of the article. The degree of accuracy of the spinneret measurements is low, primarily because of the very flexible telescoping spinneret joints and the absence of a visibly abrupt transition from intersegmental membrane to sclerotized cuticle at the proximal end of the two distal articles. All appendage character states were recorded from the left appendage (unless missing, damaged, or not fully regenerated) except for CTP, CTR, ITS, IMS, and PTS, which were recorded from both right and left appendages.

I took measurements with a Wild M-5 stereomicroscope with 20× eyepiece lenses and an eyepiece micrometer scale. CL and CW measurements are accurate to 0.038 mm, all pedipalp and leg I measurements are accurate to 0.018 mm, and all other measurements are accurate to 0.009 mm. All measurements are given in millimeters.

Spermathecae were examined by removing with forceps and dissecting needles the portion of the body wall to which they are attached, clearing in 85 percent lactic acid, teasing off overlying nontransparent tissues, placing the preparation dorsal side up in lactic acid under a cover slip on a microscope slide, and viewing through a compound light microscope at 400×. Spermathecae were then drawn with the aid of a drawing tube.

Each species description is a composite of all the adult specimens examined; these sample sizes are given in table 1. Adult females are recognized by the sclerotized area on the anterior genital lip and by the spermathecae, visible through the intact body wall. The quantitative character values recorded in table 1 are an integral part of each description. Color descriptions are based on preserved specimens observed under alcohol and illuminated by an incandescent microscope bulb; color slides of one *C. platnicki* specimen indicate that these spiders are markedly darker in life.

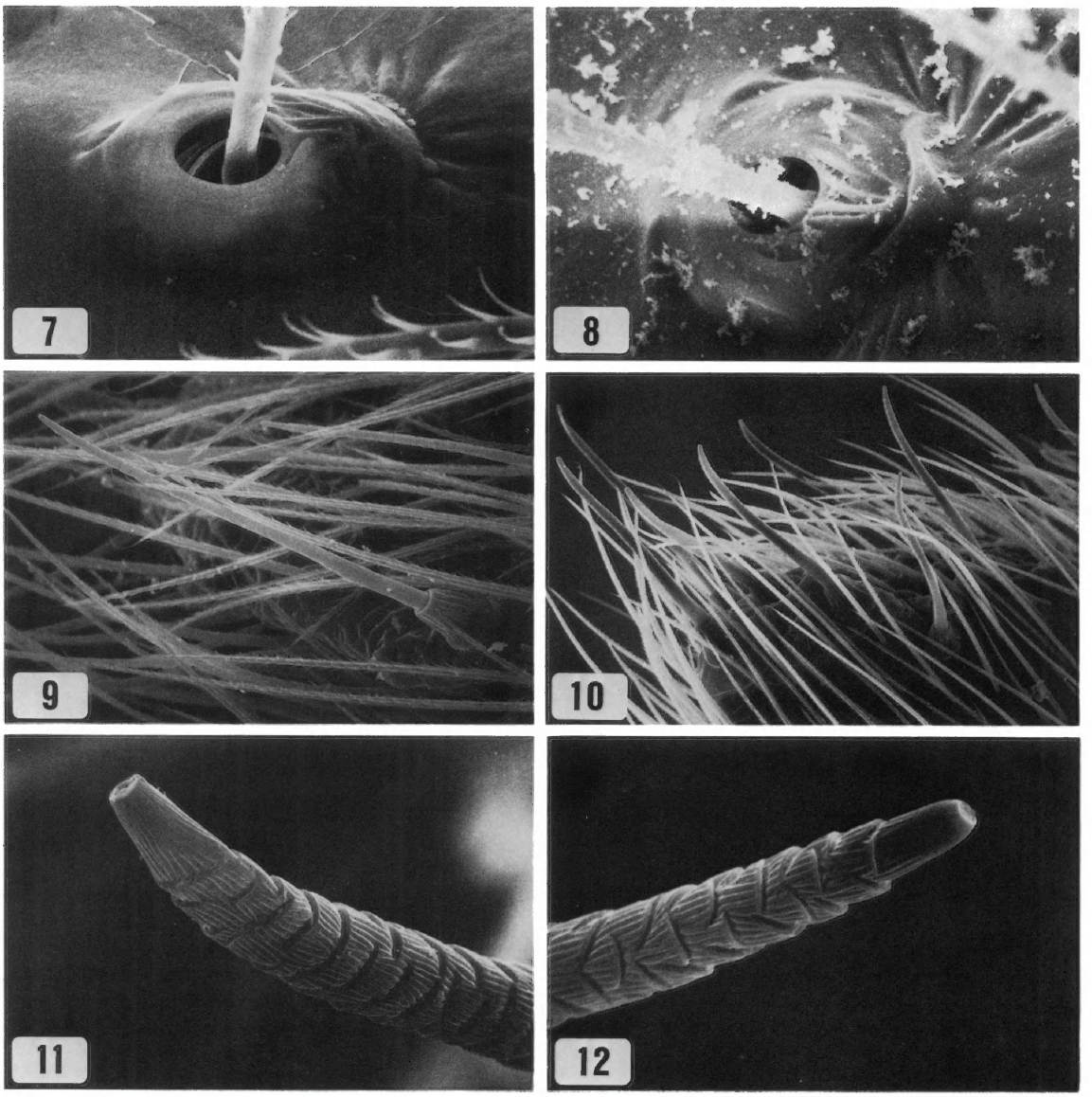
CHILEHEXOPS, new genus

TYPE SPECIES: *Chilehexops platnicki*, new species.

ETYMOLOGY: The generic name is derived from the country (Chile) where both species have been collected and the Greek words *hex* (six) and *ops* (eye); it is masculine in gender.

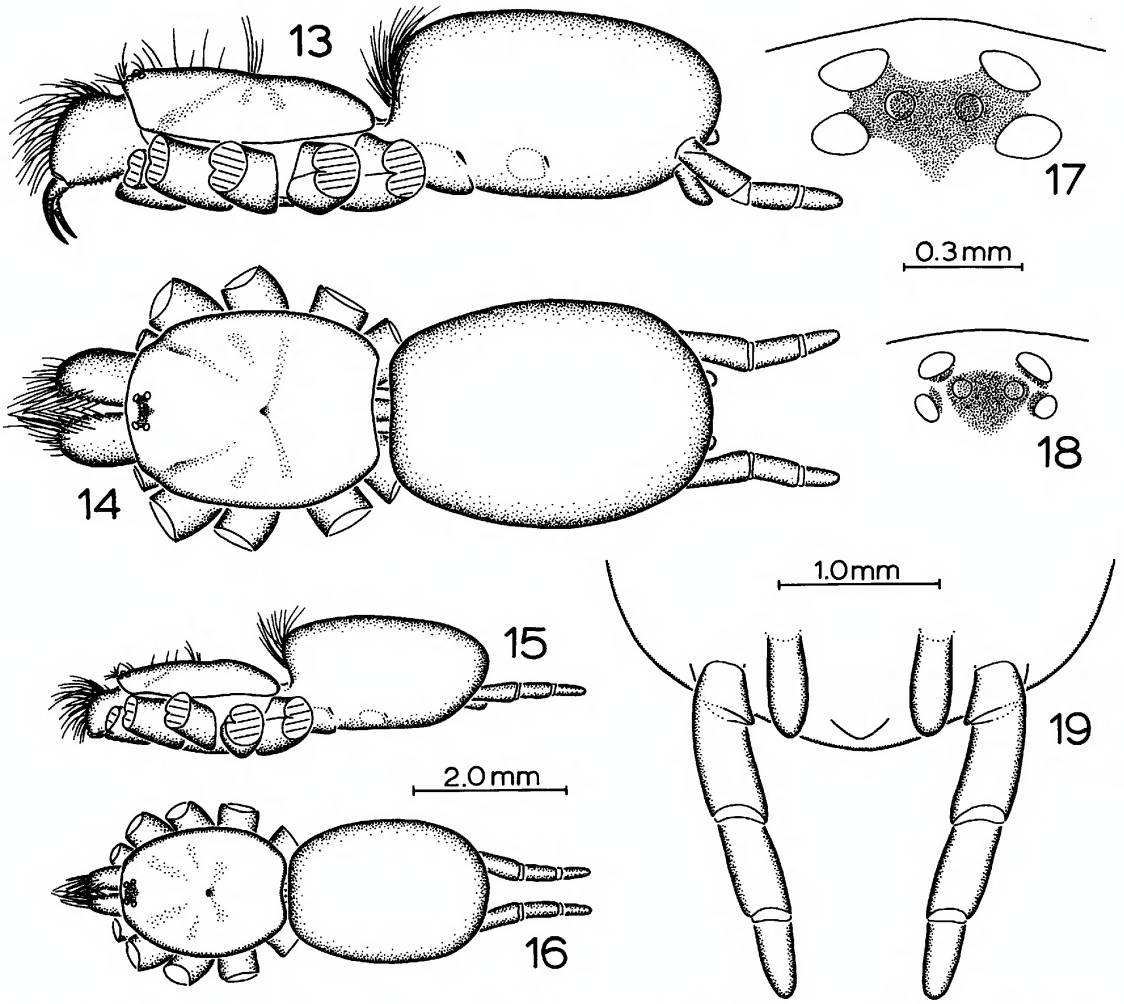
DIAGNOSIS: *Chilehexops* can be distinguished from other diplurid genera by the following character states: (1) the absence of posterior median eyes (figs. 17, 18); (2) heavily sclerotized spermathecal trunks (figs. 28–34); (3) a male palpal tibia nearly as long as the femur (PTL(100)/PFL = 90–100, figs. 22, 25); and (4) the absence of mating spurs, apophyses, and keels on the legs of adult males.

DESCRIPTION: Small mygalomorph spiders (CL = 1.46–3.27) (figs. 13–16). Carapace with moderately dense to dense covering of slender recumbent setae; two (sometimes one or three) large erect setae on each side of midline just in front of fovea, single row of large erect setae extending posteriorly from ocular quadrangle along midline toward fovea, and several prominent erect setae on and in front of ocular quadrangle. Pars cephalica slightly or not elevated above pars thoracica. Fovea a shallow rounded depression to deep pit; often slightly transverse or triangular. Six eyes forming compact quadrangle wider than long and slightly elevated (figs. 17, 18); anterior median eyes well developed; anterior row strongly procurved; one pair of posterior eyes present; central portion of quadrangle dark brown or black. Sternum longer than wide (fig. 20). Six inconspicuous, small, circular sigilla on lateral margins of sternum; transverse setaless area just behind labium formed by two fused labiosternal sigilla. Erect setae distributed over entire sternum (sometimes rare in center), larger and more numerous on margins. Labium (fig. 20) about two times



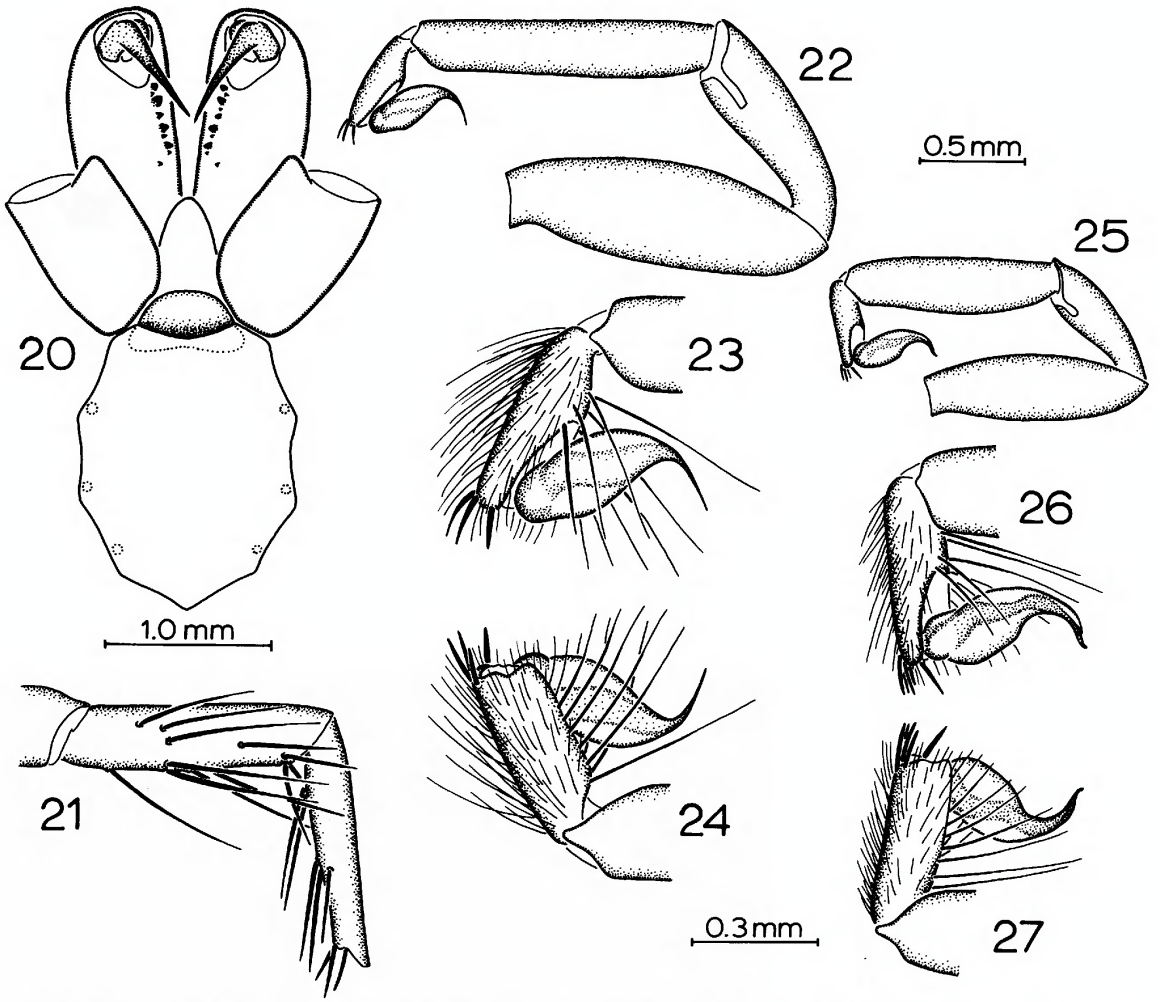
Figs. 7–12. 7, 8. Trichobothrial base on female tarsus I. **7.** *Chilehexops platnicki,* new species, 2665×. **8.** *C. australis* (Mello-Leitão), 3620×. **9.** Spigot on median spinneret of female *C. platnicki,* new species, 635×. 10–12. Spigots on terminal article of lateral spinneret of female. **10, 11.** *C. platnicki,* new species, 330×, 3430×. **12.** *C. australis* (Mello-Leitão), 4130×.

wider than long, steeply inclined from plane of sternum, without cuspules. Chelicerae with one row of 6 to 13 teeth (varying from very small to large) on promargin of fang furrow and 1 to 4 teeth on retrolateral margin at or just beyond proximal end of promarginal row (fig. 20). No rastellum. Numerous very long downcurved bristles extend forward from anterior cheliceral face (figs. 13–16). Maxillae without cuspules; maxillary lobe short, triangular, blunt-tipped (fig. 20); serrula a broad band (tapering at both ends) of sharp conical teeth (fig. 1); prolateral surface of maxilla with bifid hairs (fig. 1). Pedipalp claw with single row of 11–14 teeth. Pedipalp of adult male with elongate patella and tibia (figs. 22, 25); tibia nearly cylindrical, only slightly shorter than femur; tarsus with three to five terminal



Figs. 13–19. **13–16.** Whole body views of *Chilehexops platnicki,* new species, 2.0 mm scale. 13, 14. Female. **13.** Lateral. **14.** Dorsal. 15, 16. Holotype male. **15.** Lateral. **16.** Dorsal. 17, 18. Dorsal views of female eyes, 0.3 mm scale. **17.** *C. platnicki,* new species. **18.** *C. australis* (Mello-Leitão), holotype. **19.** Ventral view of female spinnerets, *C. platnicki,* new species, 1.0 mm scale.

spines and two ventral rows of long slender macrosetae, one on each side of palpal organ (figs. 23, 24, 26, 27); tarsus tip not extending much beyond base of palpal organ. Bulb of palpal organ elongate; gradually tapering into strongly curved embolus (figs. 22–27). Legs with three tarsal claws (figs. 3, 4); single row of many teeth on each superior claw (fig. 3); row of two to four teeth attached directly to unpaired claw of tarsus I (fig. 4). Tarsi not pseudosegmented. Usually four (occasionally three or as many as nine) spines on tarsus I (in two rows on prolateral and retrolateral aspects of ventral surface). Tarsal organ a mound with concentric ridges surrounding central depression with small protrusion in its center (figs. 5, 6). No scopulae or metatarsal preening combs. Two rows of trichobothria on dorsal surface of each tibia; single row dorsally on each metatarsus and tarsus. Trichobothrial bases with few corrugations (figs. 7, 8). Metatarsi III and IV with large number of very long spines. Male legs without obvious specializations for clasping female, but several long suberect spines clustered on prolateral and ventral surface of tibia I (fig. 21). Anterior face of abdomen with many long strong setae that curve dorsoposteriorly with the contour of the abdomen (figs. 13, 15). Anterior genital lip of female with



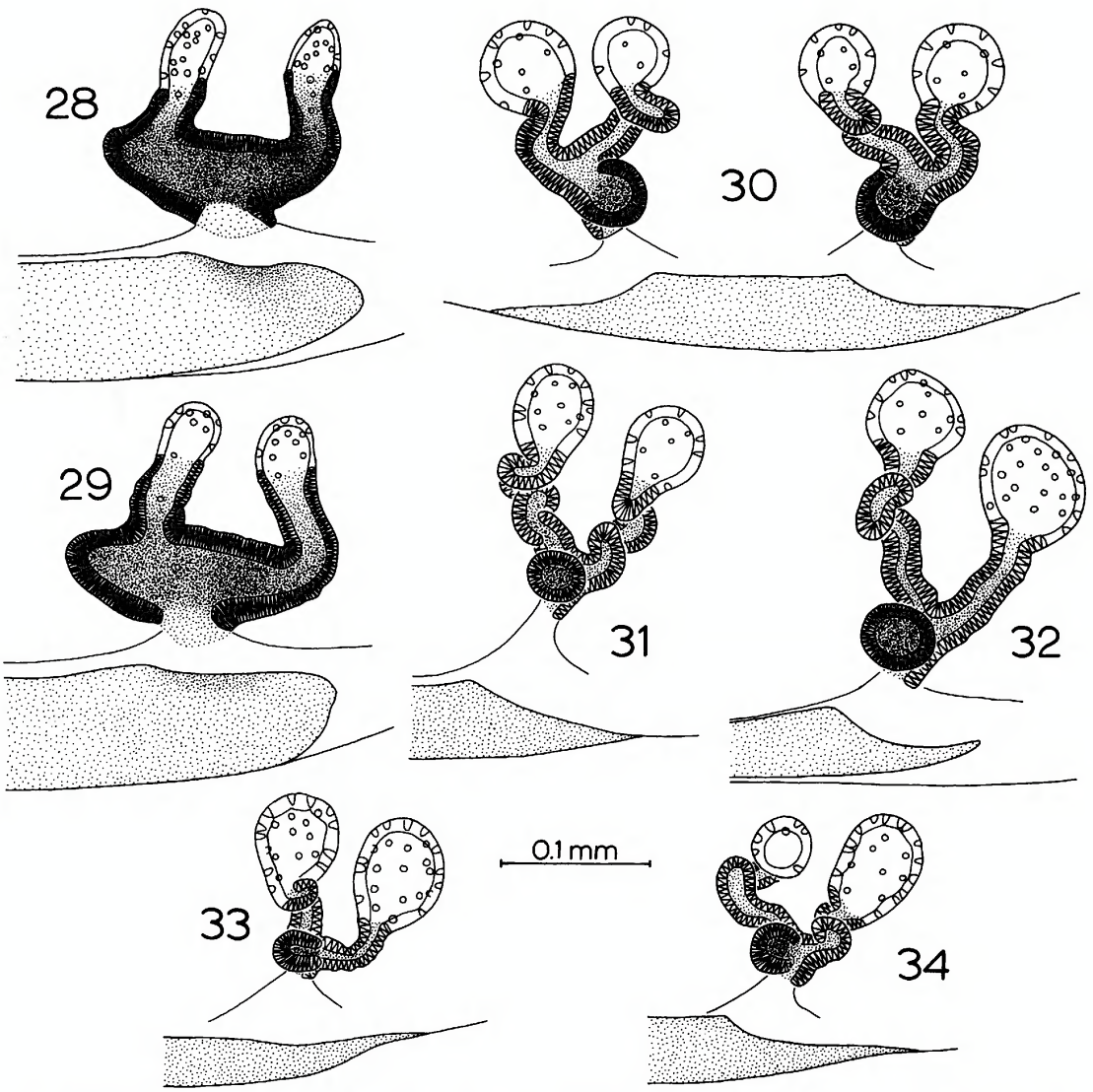
Figs. 20–27. 20–24. *Chilehexops platnicki,* new species. **20.** Ventral view of sternum, labium, maxillae, and chelicerae of female, 1.0 mm scale. **21.** Prolateral view of left tibia and metatarsus I of holotype male, 0.5 mm scale. 22–24. Left pedipalp of *C. platnicki,* new species, paratype male. **22.** Retrolateral view, 0.5 mm scale. **23, 24.** Retrolateral, prolateral views, 0.3 mm scale. 25–27. Left pedipalp, *C. australis* (Mello-Leitão), male. **25.** Retrolateral view, 0.5 mm scale. **26, 27.** Retrolateral, prolateral views, 0.3 mm scale.

transverse sclerotized plate visible in posteroventral view. Two heavily sclerotized spermathecal trunks, each with two sclerotized stalks, each stalk ending in unsclerotized bulb (figs. 28–34). Four spinnerets (fig. 19); median pair short, unsegmented, without crescent-shaped sclerite at base; lateral pair moderately long (three to four times length of median spinnerets; shorter than carapace), with basal article longest, terminal article digitiform and equal to or slightly shorter than middle article. Spigots (figs. 9–12) with long slender shaft distally sculptured by deep transverse grooves terminating longitudinal ridges, giving impression of slightly overlapping ridged scales; tip tapers to simple circular opening.

Chilehexops platnicki, new species

Figures 1, 3–5, 7, 9–11, 13–17, 19–24, 28, 29; map 1

TYPES: Male holotype and one male and six female paratypes collected under rocks on a scrubby mountainside at an elevation of 460 m, 3 km south of Vallenar, Atacama,



Figs. 28–34. Spermathecae, dorsal view, 0.1 mm scale. **28, 29.** Right spermatheca, *C. platnicki,* new species. 30–34. *C. australis* (Mello-Leitão). **30.** Both spermathecae and entire genital plate, 117 km N Vallenar. 31–34. Right spermatheca. **31, 32.** S Vallenar, Panamericano km 630. **33.** Guayacan. **34.** Juncal.

Chile (January 7, 1985; N. Platnick and O. Francke), deposited in the American Museum of Natural History.

ETYMOLOGY: The specific name is a patronym in honor of Dr. Norman I. Platnick, distinguished arachnologist and collector of the type series.

DIAGNOSIS: Males of *C. platnicki* have a distinctive embolus that tapers gradually to a long, slender terminal portion with an unbent tip (figs. 22–24); also the pedipalpal tibia is proportionally more slender (PTD(100)/PTL = 17.9, 18.4; fig. 22) than that of *C. australis.* The spermathecae of *C. platnicki* differ from those of *C. australis* in the following ways (figs. 28, 29): bulbs only slightly wider than stalks, median stalk relatively short and without sharp bends or loops, and trunk very broad and very heavily sclerotized. The leg I articles of *C. platnicki* females are proportionally longer (ITL(100)/CL = 47–52) than those of almost all *C. australis* females (ITL(100)/CL = 40–47).

MALES: Figures 15, 16, 21–24; table 1. Pal-

TABLE 1

Quantitative Character Values for *Chilehexops* Species

Character abbreviations are defined in the methods section of the text. Sample size in parentheses after species name; this is doubled for CTP, CTR, ITS, IMS, and PTS because both right and left appendages are included. Measurements given in mm. Range, mean, and standard deviation given for sample sizes larger than 4.

	platnicki ♂ (2) holotype		*australis* ♂ (1)	*platnicki* ♀ (6)		*australis* ♀ (15)		*australis* ♀ (1) holotype
CTP	8, 9	8, 9	6, 7	8–12	(9.7 ± 1.4)	7–13	(9.1 ± 1.5)	12, 12
CTR	1, 1	1, 1	1, 1	1	(1 ± 0)	1–4	(1.5 ± 0.8)	2, 3
ITS	12, 12	15, 13	10					
IMS	8, 8	8, 7	9					
PTS	4, 4	4, 3	5					
CL	2.08	2.08	1.54	2.46–3.27	(2.98 ± 0.30)	1.46–2.93	(2.25 ± 0.39)	2.39
CW	1.69	1.73	1.16	1.93–2.62	(2.37 ± 0.25)	1.16–2.46	(1.79 ± 0.34)	1.81
OQW	0.426	0.426	0.278	0.481–0.629	(0.558 ± 0.057)	0.259–0.518	(0.387 ± 0.076)	0.352
ALS	0.157	0.157	0.111	0.167–0.222	(0.199 ± 0.018)	0.093–0.185	(0.139 ± 0.032)	0.120
AMS	0.065	0.065	0.046	0.074–0.111	(0.091 ± 0.012)	0.046–0.111	(0.072 ± 0.019)	0.074
AMD	0.056	0.056	0.037	0.056–0.074	(0.065 ± 0.008)	0.037–0.056	(0.046 ± 0.007)	0.046
ALD	0.120	0.120	0.083	0.130–0.185	(0.156 ± 0.021)	0.083–0.167	(0.123 ± 0.023)	0.111
PFL	1.48	1.52	1.04					
PPL	1.09	1.13	0.72					
PTL	1.41	1.44	0.96					
PTD	0.26	0.26	0.26					
PTarL	0.48	0.48	0.44					
IFL	1.70	1.70	1.17	1.70–2.17	(1.98 ± 0.18)	1.00–1.85	(1.47 ± 0.25)	1.46
ITL	1.15	1.17	0.70	1.22–1.50	(1.40 ± 0.11)	0.63–1.22	(0.93 ± 0.17)	0.93
IML	1.18	1.18	0.70	1.06–1.33	(1.24 ± 0.11)	0.54–1.02	(0.80 ± 0.15)	0.81
ITarL	0.65	0.65	0.39	0.63–0.70	(0.68 ± 0.03)	0.37–0.59	(0.50 ± 0.07)	0.50
MSL	0.44	0.45	0.29	0.48–0.67	(0.59 ± 0.07)	0.28–0.54	(0.44 ± 0.08)	0.37
LSL1	0.65	0.70	0.43	0.70–1.00	(0.86 ± 0.12)	0.37–0.89	(0.61 ± 0.15)	0.48
LSL2	0.46	0.50	0.28	0.46–0.63	(0.57 ± 0.06)	0.24–0.46	(0.34 ± 0.06)	0.32
LSL3	0.46	0.44	0.26	0.39–0.54	(0.47 ± 0.08)	0.20–0.41	(0.30 ± 0.06)	0.30
PTD(100)/PTL	18.4	17.9	26.9					
PTL(100)/PFL	95.0	95.1	92.9					
ITL(100)/CL				47–52	(48.6 ± 1.9)	40–47	(42.8 ± 2.2)	40

pal tibia very long, slender, nearly cylindrical; slightly swollen in proximal half. Embolus gradually tapering to long, slender terminal portion not bent in lateral view. Carapace, chelicerae, and legs pale yellow-tan; abdomen and spinnerets paler white-tan.

FEMALES: Figures 1, 3–5, 7, 9–11, 13, 14, 17, 19, 20, 28, 29; table 1. Genital plate rounded at both ends; greatest sclerotization near openings into two spermathecal trunks. Spermathecal trunk very heavily sclerotized, very broad, with large lumen. Both stalks relatively short and straight. Bulbs relatively small, only slightly wider than stalks. Carapace and legs pale yellow-tan to light orange-tan. Chelicerae darker orange-tan to medium amber-brown. Abdomen very pale grey-tan.

DISTRIBUTION: Known only from the type locality in the southern part of northern Chile (map 1).

MATERIAL EXAMINED: Only the type specimens and several other females and juveniles collected with them.

Chilehexops australis (Mello-Leitão), new combination

Figures 6, 8, 12, 18, 25–27, 30–34; map 1

Accola australis Mello-Leitão, 1939, p. 43, figs. 1, 1a (female holotype, 121a, from Santiago, Chile,

in NMB, examined). Bonnet, 1955, p. 141. Raven, 1985, pp. 79, 160.

Masteria australis: Legendre and Calderón, 1984, p. 1055, pl. 18, figs. 1–9.

DIAGNOSIS: The male of *C. australis* has a distinctive embolus (figs. 25–27), which in lateral view is broad but tapers suddenly near the strongly bent tip and has a thin keel distally on its retrolateral surface; the palpal tibia is also more swollen (PTD(100)/PTL = 26.9; fig. 25) than that of *C. platnicki*. Females of *C. australis* have distinctive spermathecae (figs. 30–34), with bulbs much wider than stalks, a long sharply bending and/or looping median stalk, and a heavily sclerotized dorsomedian spheroid protuberance on the relatively narrow trunk.

MALES: Figures 25–27; table 1. Palpal tibia long; moderately swollen over most of length. Embolus broad in lateral view but narrowing suddenly near strongly bent tip; thin retrolateral keel on distal half. Carapace, chelicerae, and legs rather dark amber-tan. Abdomen and spinnerets pale white-tan.

FEMALES: Figures 6, 8, 12, 18, 30–34; table 1. Genital plate in dorsal view usually tapered, pointed (but sometimes blunt) at each end. Relatively narrow, heavily sclerotized spermathecal trunk with very heavily sclerotized spheroid dorsomedian protuberance. Median stalk moderately long to long, with sharp bends and/or loops. Bulbs much wider than stalks. Carapace and legs orange-tan; chelicerae darker amber-tan. Abdomen pale grey-tan.

REMARKS: When I examined it in June 1985, the holotype specimen was in poor condition; the most serious defect was the absence of the ventral half of the abdomen and, consequently, the spermathecae. Although I have not been able to observe the spermathecae, for the following reasons I am reasonably confident that the holotype is conspecific with the other specimens included in this description: (1) Legendre and Calderón's (1984, pl. 18, fig. 9) drawing of the holotype's spermathecae, although lacking such important details as the spheroid protuberance on each trunk, is very similar to the spermathecae of the females I have assigned to *C. australis*. (2) All of the *Chilehexops* specimens I have examined from Santiago Province (where the type was collected) and adjacent Aconcagua Province have the *C. australis* spermathecal form and, like the holotype, are smaller and have lower ITL(100)/CL values than known *C. platnicki* females.

DISTRIBUTION: Northern Chile, from Santiago Province north into Atacama Province (map 1).

MATERIAL EXAMINED: CHILE: *Aconcagua:* Juncal, elev. 1950 m, in small webs under rocks, Jan. 1984 (E. Maury, P. Goloboff, MACN 8290), 11♀, juvs.; Quebrada Huaquen, Caleta Pichicuy, elev. 30–40 m, south-facing slope, under rock, Jan. 1984 (E. Maury, P. Goloboff, MACN 8295), 1♀; Rio Blanco, Oct. 4, 1983 (E. Maury, MACN 8293), 1♀. *Atacama:* 77 km S Copiapo, Oct. 4, 1983 (E. Maury, MACN 8294), 2♀, juvs.; S. Vallenar, Panamericano km 630, Oct. 1, 1980 (L. E. Pena, E. Domeyko, AMNH), 1♂, 3♀; 3 km S Vallenar, elev. 460 m, scrubby mountainside, under rocks, Jan. 1, 1985 (N. I. Platnick, O. F. Francke, AMNH), 1♀; 117 km N Vallenar, Dec. 21, 1963 (Buzeta, AMNH), 1♂, 1♀. Coquimbo: 3 km E El Tofo, elev. 45 m, scrubby mountainside, under rocks, Jan. 7, 1985 (N. I. Platnick, O. F. Francke, AMNH), 2♀; Los Cristales, 15 km SSW Ovalle, Oct. 1, 1983 (L. E. Pena, AMNH), 1♀. *Santiago:* Guayacan, Rio Colorado, under rock, Jan. 1984 (E. Maury, P. Goloboff, MACN 8291), 1♀; Santiago, 1910 (A. Masarey, NMB 121a), 1♀ (holotype).

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